

112141

**RECORD OF DECISION  
HEREFORD GROUNDWATER SITE / CROSSLEY FARM**

**DECLARATION**

**SITE NAME AND LOCATION**

Hereford Groundwater / Crossley Farm Site  
Huff's Church  
Berks County, Pennsylvania

**STATEMENT OF BASIS AND PURPOSE**

This decision document presents the interim remedial action for the Hereford Groundwater / Crossley Farm Site ("Site") in Huff's Church, Berks County, Pennsylvania. The interim remedial action was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), 42 U.S.C. Sections 9601 et seq.; and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the the interim remedy for this Site. The information supporting this interim remedial action decision is contained in the administrative record for this Site.

The Commonwealth of Pennsylvania concurs with the selected interim remedy.

**ASSESSMENT OF THE SITE**

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision ("ROD"), may present an imminent and substantial endangerment to public health, welfare, or the environment.

**DESCRIPTION OF THE SELECTED INTERIM REMEDY**

This interim remedy will provide point of entry treatment systems to the residents who are impacted by contamination from the Site and provide the potential for additional residential point of entry systems if needed in the area of the Site. The filter treatment units will be maintained and residential wells would be periodically monitored. Water pumped from the private wells would be passed through the treatment systems at the point of entry into the homes. Each typical treatment system would be composed of a prefilter to remove suspended solids, dual in-series activated-carbon units to remove VOCs, and an ultraviolet (UV) radiation unit to provide disinfection. Depending on the contaminants identified at specific residences, additional treatment components may be required, such as pH adjustment or a water-softening unit to remove manganese and iron. The activated carbon would be replaced on a periodic basis

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or when breakthrough is identified. Through the provision of these treatment systems, contaminant concentrations would be reduced to below the drinking water criteria.

This remedy is an interim action to address the potential risk to residences through drinking water from their wells which are contaminated with volatile organic compounds. Currently a study known as a Remedial Investigation and Feasibility Study (RI/FS) is underway to define the nature and extent of contamination in the soil, sediment, surface water and ground water media. The results of the study will aide EPA's evaluation of the current and future potential risk to humans and the environment associated with contaminants found in soil, sediment, surface water and ground water. The study wiull continue through the summer of 1997 with final reports available by the Summer or Fall of 1998. Once the reports are finalized, EPA will propose a final remedy for the entire Site.

At that time, EPA will issue a proposed plan which will include some of the alternatives outlined in this ROD as well as some new alternatives that would address contaminated media which currently or in the future would pose an unacceptable risk to humans or the environment. Therefore this interim remedy is considered temporary until the RI/ FS is completed.

#### DECLARATION OF STATUTORY DETERMINATIONS

This interim action is protective of human health and the environment, complies with federal and State applicable or relevant and appropriate requirements for this limited-scope action and is cost-effective. Although this interim action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and thus is in furtherance of that statutory mandate. Because this action does not constitute the final remedy for the Hereford Groundwater / Crossley Farm Site, the statutory preference is only partially addressed in this interim remedy. Subsequent actions are planned to address fully the threats posed by the conditions at this Site.

Because this interim remedy will result in hazardous substances remaining on Site above health-based levels, a review under Section 121(c) of CERCLA, 42 U.S.C. §9621(c) will be conducted to ensure that the interim remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action. Because this is an interim Record Of Decision, review of this site and of this remedy will be ongoing as EPA continues to develop final remedial alternatives for the Site



Thomas C. Voltaggio, Director  
Hazardous Waste Management Division

6/30/97

Date

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**RECORD OF DECISION  
HEREFORD GROUNDWATER / CROSSLEY FARM SITE**

**DECISION SUMMARY**

**I. SITE NAME, LOCATION AND DESCRIPTION**

The Hereford Groundwater / Crossley Farm Site is located approximately 7 miles southwest of Allentown in the Huffs Church community of Hereford Township, Berks County, Pennsylvania shown in Figure 1. The site is located along the southern side of Huffs Church Road, approximately 3 miles west-northwest of State Route 100 and northwest of the borough of Bally. The general Site features are shown on Figure 2.

The Site is located in the Reading Prong Physiographic Province. The topography reflects the complex underlying bedrock geology and consists of high hills and ridges underlain by bedrock. The most prominent highland within the study area occurs at the Site and is known locally as Blackhead Hill. The hill is very steeply sloped to the west and south of its crest. To the north and east of its crest, the hill is fairly level or flat and supports a working farm over much of its area. The crest of Blackhead Hill is underlain by the Hardyston Quartzite, which makes an attractive building stone. A small quarry at the crest of the hill has had some limited activity for nearly 50 years.

From the mid-1960s to the mid-1970s, a local plant reportedly sent numerous drums to the Crossley Farm for disposal. These drums contained mostly liquid waste and were described as having a distinctive "solvent" odor. The plant was believed to have used trichloroethene (TCE) as a degreaser from at least the mid-1960s until 1973 and tetrachloroethene (PCE) from at least the early 1960s until 1980.

Known and alleged waste disposal areas include a household dump, the quarry, and a borrow pit area. The dump is located approximately 2,000 feet south of Huffs Church Road and reportedly consists chiefly of household trash. The quarry is located approximately 3,000 feet south of Huffs Church Road and is allegedly a former site of unregulated disposal of hazardous waste, chiefly chlorinated solvents. The borrow area is located approximately 400 feet east of the quarry and is allegedly a former unregulated staging and/or disposal area of hazardous wastes, chiefly chlorinated solvents. All of these suspected source areas are being investigated by the ongoing remedial investigation.

**II. SITE HISTORY**

Regulatory involvement at this Site began in 1983, when local residents complained to the Pennsylvania Department of Environmental Protection (PADEP) about odors in private water supply wells. A PADEP sampling program of local wells conducted in September 1983 revealed concentrations of TCE as high as 8,500 micrograms/liter (ug/L) and PCE as high as 110 ug/L.

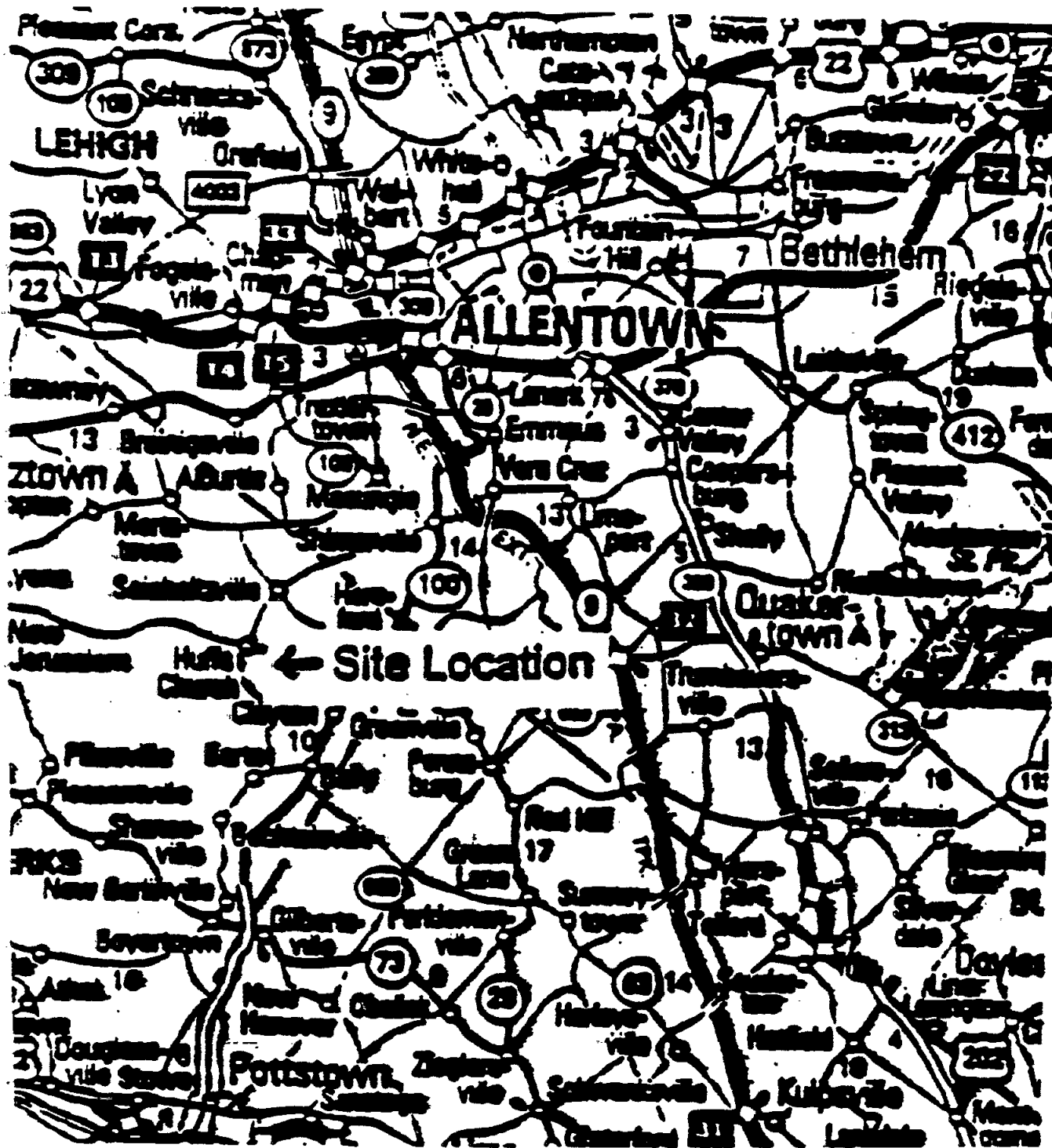


FIGURE 1  
SITE LOCATION MAP



The Maximum Contaminant Levels (MCLs) for TCE and PCE established under the Safe Drinking Water Act are 5 ug/L for both compounds. A subsequent sampling round conducted by PADEP and EPA in November 1983 revealed that eight home wells contained detectable levels of TCE, and in six of these wells the concentrations of TCE exceeded 200 ug/L.

As a result of the November 1983 sampling, PADEP issued a health advisory on groundwater use in the area and recommended either boiling water, installing carbon filtration systems, or using bottled water where TCE concentrations exceeded 45 ug/L. Shortly thereafter, a temporary water supply was provided by the Pennsylvania National Guard through the Pennsylvania Emergency Management Agency. This supply was terminated in mid-1985.

After the health advisory was issued, local residents began to voice concerns about Crossley Farm and alleged dumping of wastes there. In response to these concerns, EPA conducted a preliminary assessment (PA) of the property. The PA, completed in June 1984, concluded that insufficient information existed to identify the source of the groundwater contamination and suggested that a regional groundwater study be conducted.

Further citizen complaints in August 1986 prompted additional rounds of sampling by EPA in September 1986. TCE levels detected during these rounds ranged up to 19,000 ug/L. Additional well sampling in November 1986 detected TCE at a maximum level of 22,857 ug/L.

EPA initiated an emergency response in December 1986 and, in January 1987, EPA began installing carbon filtration units on the most severely impacted private wells. A contaminant concentration level of 180 ug/L of TCE or greater was used as the criterion for installing a filter for any particular well. This criterion for the emergency response action in 1987 was developed in consultation with the Agency for Toxic Substances and Disease Registry (ATSDR) and was based on one-half of the Drinking Water Equivalent Level (DWEL). A total of 15 carbon filter units have been installed and are maintained by EPA. A contractor services the units approximately every 2 months, and the carbon units are rotated about every 6 months. EPA is still monitoring the operation of these treatment units.

In the spring of 1987, EPA initiated a regional hydrogeological investigation to include the installation and sampling of on-site and off-site monitoring wells and the sampling of residential well supplies. This investigation, completed in August 1988, concluded that the source of the TCE in the groundwater was near the crest of Blackhead Hill. The abandoned quarry and the borrow pit area were cited as the presumed source areas. The investigation delineated a contaminated groundwater plume extending approximately 7,000 feet downgradient from Blackhead Hill and along Dale Road.

Concurrent with and independent of the EPA study, residential wells near Dale Road were sampled and analyzed for polychlorinated biphenyls (PCBs) and other contaminants as part of a PADEP investigation of the Texas Eastern - Bechtelsville compressor station. One residential well located on Forgedale Road contained TCE at levels greater than 200 ug/L, suggesting that

the TCE plume associated with the Crossley Farm Site extended even farther to the south than mapped, since TCE was determined not to be a common waste product from compressor station operations. This result prompted additional sampling by EPA along Forgedale Road, south to Old Route 100, as part of the Crossley Farm investigation. These analytical data indicated that the plume extended south of the compressor station and Forgedale Road and about 9,000 feet downgradient from Blackhead Hill.

In February 1991, EPA issued the final Hazard Ranking System (HRS) package for the Crossley Farm Site in preparation for the Site's proposal for the National Priorities List (NPL). In July 1991, the site was proposed for the NPL. The Site was formally listed on the NPL in October, 1992.

In September 1994, EPA initiated a remedial investigation and feasibility study (RI/FS) for the Site to evaluate existing data, collect additional data as necessary and consider appropriate actions. EPA decided to expedite evaluation of alternatives to address the contaminated residential well supply problem by preparing a focused feasibility study (FFS) prior to completion of the remaining Site investigation activities.

### **III. ENFORCEMENT HISTORY**

Before initiating the work plan for the Remedial Investigation and Feasibility Study for this site, EPA conducted interviews and sent out 104e letters requesting information from individuals who may have been involved in the disposal activities at the Site. Some reports indicated that drums of "solvent wastes" were picked up at the Bally Case and Cooler plant in Bally and taken to the Crossley Farm. Others have contacted EPA during some of the early removal activities on-site in 1986 indicating that they knew where drums were buried on the farm. However at this time there has not been any physical evidence of uncovered drums to substantiate these allegations. The remedial investigation is expected to look for any buried drums and may then lead us to the identity of responsible parties.

### **IV. HIGHLIGHTS OF COMMUNITY PARTICIPATION**

The Focused Feasibility Study and the Proposed Plan for the Hereford Groundwater / Crossley Farm Site were released to the public on February 10, 1997. These two documents were made available to the public in both the administrative record and an information repository maintained at the EPA Docket Room in Region III, the Hereford Township and the Washington Township offices. The notice of availability for these two documents was published in the Allentown Morning Call on February 10, and February 26, 1997. A public comment period on the documents was held from February 10 to March 12, 1997. In addition, a public meeting was held on March 5, 1997. At this meeting, representatives from EPA and its contractors answered questions about problems at the site and the remedial alternatives under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision. This decision document presents the selected interim remedial action for the Site chosen in accordance with CERCLA as amended by

SARA and to the extent practicable, the National Contingency Plan. The decision for this Site is Based on the Administrative Record.

## **V. SCOPE AND ROLE OF THIS INTERIM REMEDIAL ACTION**

EPA's Interim Remedial Action for this Site is to provide point of entry treatment systems to the residents who are impacted by contamination from the Site and to provide the potential for additional residential point of entry systems if needed in the area of the Site. The filter treatment units will be maintained and residential wells would be periodically monitored.

This interim action would continue to address the immediate threat to residences who have drinking water wells which are contaminated with volatile organic compounds until the remedial investigation and feasibility study (RI/FS) are complete and a final remedy is selected as well as implemented. Currently, EPA is in the process of conducting an RI/FS to define the type and degree of contamination in soil, sediment, surface water and ground water. Once the RI/FS is complete, EPA will propose a final remedy for the Site and will solicit input from the public and community as part of the process to ultimately make a decision on a final remedy for the Site. The RI/FS is expected to continue through the Summer and Fall of 1997 and final reports should be available by the Summer and Fall of 1998.

## **VI. SUMMARY OF SITE CHARACTERISTICS**

The full nature and extent of contamination in all media associated with the disposal of hazardous wastes on the Crossley Farm Site is unknown at this time and will be delineated by the remedial investigation. At present, significant data exists regarding the nature and lateral extent of volatile **organic compounds** in groundwater, and limited data exists regarding the nature of semivolatile and **inorganic compounds** in groundwater.

### **Volatile Organic Compounds**

Volatile organic compounds (VOCs) have been detected at significant levels in groundwater through the multiple sampling of 21 monitoring wells and numerous home wells. During the last sampling round (November/December 1995), nearly all potable wells and springs within the study area (a total of 104 different groundwater sources) were sampled for VOCs in support of the FFS, and to gather data to aid in the scoping of the remedial investigation. The analytical results from all sampling rounds indicate that a large plume of contaminated groundwater originates near the crest of Blackhead Hill and is migrating southward and downgradient approximately 9,000 feet into the Dale Valley. The principal chemical components of this plume are the VOCs trichloroethene (TCE) and tetrachloroethene (PCE), though a few other compounds also appear, but much less consistently, and at lower concentrations. Neither the precise source location(s), nor the vertical distribution of the extent of the contamination is known at this time.

## **Semivolatile Organic Compounds**

Limited data exists concerning the nature and extent of semivolatile organic compounds (SVOCs) at the Site. Based on the close proximity to the suspected source and the historically high concentrations of VOCs, 14 residential wells were analyzed during the September 1995 and/or the November/December 1995 sampling rounds for these compounds. No other wells or media have been analyzed for SVOCs. The limited data suggest that the groundwater is not significantly impacted by SVOCs. The wells selected for analysis are either located closest to the Site or historically have had the highest levels of VOCs in their groundwater. Therefore, they would be considered the wells most likely to contain SVOCs. The analyses, however, indicate that the distribution of SVOCs is irregular and their concentrations are very low (equal to or less than 1 ug/L).

## **Inorganic Compounds**

Limited data exists concerning the nature and extent of metals at the Site. A total of 14 residential wells were analyzed for metals during the September 1995 and/or the November/December 1995 sampling rounds. No other wells or media have been analyzed for metals. The limited data suggest that off-site groundwater may be impacted by metals. Based on their concentrations relative to EPA Region III Risk Based Concentration Tables -1996, the metals, cadmium, copper, iron, lead and manganese, were all selected as chemicals of concern during the preliminary risk assessment conducted for the FFS. The concentrations of these metals in the monitoring wells are not known at this time. It is also not known what the naturally occurring background levels of these metals may be or to what extent plumbing may be contributing to the concentration levels of some of the metals (principally lead and copper) through the leaching of these metals from the pipes by acidic groundwater. These data gaps will be investigated during the remedial investigation.

## **VII. SUMMARY OF SITE RISKS**

The basis for EPA's risk determination is The National Oil and Hazardous Substances Pollution Contingency Plan ("NCP") which establishes acceptable levels of carcinogenic risk for Superfund sites ranging from one excess cancer case per 10,000 people exposed to one excess cancer case per one million people exposed. This translates to a risk range of between one in 10,000 and one in one million additional cancer cases. Expressed as scientific notation, this risk range is between 1.0E-04 and 1.0E-06. Remedial action is warranted at a site when the calculated cancer risk level for a potentially exposed individual exceeds 1.0E-04. However, since EPA's cleanup goal is generally to reduce the risk to 1.0E-06 or less, EPA also may take action where the risk is within the range between 1.0E-04 and 1.0E-06.

The NCP also provides that sites should not pose a health threat due to a non-carcinogenic, but otherwise hazardous, chemical. EPA defines a non-carcinogenic threat by the ratio of the contaminant concentration at the site that a person may encounter to the established safe concentration. If this ratio, known as the Hazard Index (HI), exceeds one (1.0), there may be

concern for the potential non-carcinogenic health effects associated with exposure to the chemicals. The HI identifies the potential for the most sensitive individuals to be adversely affected by the noncarcinogenic effects of chemicals. As a rule, the greater the value of the HI above 1.0, the greater the level of concern.

A Draft Preliminary Risk Assessment (PRA) was completed in October 1996 to assess the potential risks to human health that could result from using contaminated groundwater underlying the Site. The PRA was developed using analytical results from the historical sampling of residential wells (VOCs, only) and from the September, November, and December 1995 sampling rounds (VOCs, SVOCs, and inorganic compounds). The PRA reviewed and screened the analytical results from all the wells and springs within the study area for which data are available, a total of 136 different groundwater sources.

The PRA also identified TCE as the major contributor to noncarcinogenic risk, with an individual HQ exceeding 1.0. Manganese, PCE, and cis-1,2-dichloroethene have HQs exceeding 1.0 for children, and trichlorofluoromethane has an HQ exceeding 1.0 for adults.

The NCP Section 300.430 requires EPA to evaluate whether the proposed action meets the Applicable or Relevant and Appropriate Requirements (ARARs). These requirements are promulgated, enforceable federal and state environmental, or public health requirements that are determined to be legally applicable or relevant and appropriate to the hazardous substances, remedial actions, or other circumstances at a CERCLA site.

In evaluating the risks for the Crossley Farm Site, ARARs identified include: the federal Safe Drinking Water Act (SDWA), MCLs and state standards which regulate the quality of treated water produced by a public water supply. MCLs are promulgated numerical values that specify the maximum permissible levels of contaminants that can be delivered to a user of public water supplies. MCLs have been promulgated by both the federal government and the Commonwealth of Pennsylvania. For the Agency's remedy selection decision, MCLs are considered relevant and appropriate in evaluating the risk from contaminated drinking water supplies for the residents living near the Crossley Farm Site.

Since the preliminary risk assessment indicates that TCE is the main contributor for both the carcinogenic and non-carcinogenic risk, the MCL of 5 micrograms per liter (ug/l) was also important for identification of the affected residents.

Upon review of the analytical data for the residential drinking water well, a total of 31 wells have had at least one historical detection of a contaminant of concern above the MCL for TCE. Two of the wells are considered public supply wells and are currently being treated with granular activated carbon. Therefore, a total of 29 wells have been identified as requiring remediation because their water exceeds the MCL for TCE, PCE or methylene chloride. The residents who currently have EPA maintained treatment units in their homes are included as part of these 29 affected residences.

## VIII. SUMMARY OF REMEDIAL ALTERNATIVES

### A. Alternative 1: No Action

The no-action alternative was developed, as required by the NCP, as a baseline to which other alternatives may be compared. Periodic reviews of Site conditions, typically every 5 years, and long-term groundwater monitoring would be the only activities conducted under this alternative.

There are no ARARs pertinent to the no-action alternative.

No capital costs are associated with the no-action alternative. The average annual cost for long-term monitoring is estimated to be \$44,120 and 5-year reviews are \$23,000 per event. Over a 30-year period, the net present-worth cost is \$597,117.

### B. Alternative 2: Delivered Water

Under this alternative, bottled or bulk water would be regularly provided to each of the 29 residences that have a water supply contaminated in excess of the federal or state primary drinking water criteria (MCLs) for TCE or one of the other chemicals.

Institutional controls such as ordinances or deed restrictions might be enacted to prohibit the use of contaminated groundwater for drinking water. Existing residential supply wells and selected monitoring wells would be incorporated into a long-term monitoring network. Groundwater would be monitored annually for VOCs and metals to assess the contaminant plume status and to assess whether additional homes may be at risk from contaminated water supplies. Because contaminants remain in the underlying aquifer and would continue to pose threats to groundwater users, 5-year reviews would be conducted to assess Site conditions and whether additional response actions would be necessary.

Two scenarios are viable under Alternative 2:

- Alternative 2A - All 29 currently affected residents would be provided with new storage tanks and delivered bulk water.
- Alternative 2B - The five homes with either an individual or cumulative risk for skin contact and breathing exposure pathways of greater than  $1E-4$  for a cancer related risk or an individual or cumulative HI greater than 1.0 for a non-cancer related risk would be provided with bulk water to prevent contact with contaminants through these pathways, and the remaining 24 affected homes would be provided with bottled water to prevent drinking of water in excess of MCLs.

Alternative 2 would be consistent with the federal and state chemical-specific ARARs for drinking water since bottled or bulk water that complies with MCLs would be provided to residences.

Alternative 2 would comply with the action-specific requirements under Title 29 of the Code of Federal Regulations for occupational safety and health since workers who perform the long-term monitoring wells or deliver bottled or bulk water would conform with these requirements.

The cost estimates developed for the two Alternative 2 scenarios are

Alternative 2A:

Capital costs:	\$120,420
Average annual operation and maintenance (O&M) costs:	\$314,440 (years 1 through 30)
Five-year reviews:	\$23,000 per event

Over a 30-year period, the net present-worth cost of Alternative 2A is \$4,071,951.

Alternative 2B

Capital costs:	\$22,270
Average annual O&M costs:	\$140,200 (years 1 through 30)
Five-year reviews:	\$23,000 per event

Over a 30-year period, the net present-worth cost of Alternative 2B is \$1,811,645.

**C. Alternative 3: Point-of-Entry Treatment**

This alternative calls for the use of point-of-entry treatment units to treat the extracted groundwater at each affected residence. Under this alternative, all 29 which exceed the MCL for TCE or some other chemical would be provided with point-of-entry treatment units. Water pumped from the private wells would be passed through the treatment systems at the point of entry into the homes. Each typical treatment system would be composed of a prefilter to remove suspended solids, dual in-series activated-carbon units to remove VOCs, and an ultraviolet (UV) radiation unit to provide disinfection. Depending on the contaminants identified at specific residences, additional treatment components may be required, such as pH adjustment or a water-softening unit to remove manganese and iron. The activated carbon would be replaced on a periodic basis or when breakthrough is identified. Through the provision of these treatment systems, contaminant concentrations would be reduced to below the drinking water criteria (MCLs).

Institutional controls such as ordinances or deed restrictions may be enacted to prohibit the use of contaminated groundwater for drinking water use, if treatment is not employed. Existing residential wells and selected monitoring wells would be incorporated into a long-term monitoring network to determine whether the water supplies of other residences may be affected and the status of groundwater contamination. Groundwater would be monitored annually for VOCs and metals. Because contaminants remain in the aquifer and would continue to pose threats to groundwater users, 5-year reviews would be conducted to assess site conditions and whether additional response actions are necessary.

Alternative 3 would be consistent with the federal and state chemical-specific ARARs since the point-of-entry treatment systems would be designed to produce potable water that meets the

numerical limits (MCLs) identified in the primary drinking water criteria.

Alternative 3 would comply with the action-specific requirements under Title 29 of the Code of Federal Regulations for occupational safety and health since workers who install and perform periodic maintenance of the treatment systems and workers who sample the long-term monitoring wells would conform with these requirements. The transport and disposal of spent activated carbon would be in compliance with the applicable portions of Resource Conservation and Recovery Act requirements (40 CFR Parts 262 and 263) and the applicable portions of the Hazardous Materials Transportation requirements (49 CFR 107, 171-179). All measures would be taken to safely remove and transport the spent carbon to a facility for regeneration.

The cost estimates developed for the Alternative 3 for the 29 residences are

Capital costs:	\$172,230
Average annual O&M costs:	\$117,240 (years 1 through 30)
Five-year reviews:	\$23,000 per event
Over a 30-year period, the net present-worth cost of Alternative 3 is \$1,676,700.	

If more residences are provided point of entry treatment units, costs will increase.

Capital costs for each additional residential filter are \$6,000 and O&M cost would increase approximately \$735 for each additional sample and analysis.

#### **D. Alternative 4: Water Line**

Under this alternative, the existing water distribution main from the nearby borough of Bally would be extended through Hereford and Washington Townships so that service lines could be provided to the 29 residences which exceed the MCL for TCE. Two construction scenarios were used in the cost estimating. One is called a branch system that would reach far enough to serve the 29 residences and the other is a looped system which would pass by the affected residents and continue along the roads in the vicinity of the Site. The extension would require excavations in or along public roadways, installation of the underground piping for the distribution main, installation of service lines to the property lines of affected residences, and connection of the service lines to the plumbing system within each household. Four booster pumping stations would be established to provide sufficient hydraulic head in the water supply in this area of very steep terrain. During construction of the water line extension, residences with contaminated groundwater in excess of MCLs or risk-based action levels would be provided temporarily with an alternate water supply (either bottled water or point-of-entry treatment systems).

It is anticipated that the Washington Township Municipal Authority would be the appropriate authority to operate and maintain the water distribution system. It currently has an agreement with the Bally Municipal Water Department to obtain water which could be used in this alternative. The Borough of Bally currently uses one of two supply wells to provide potable water to residential, commercial, and industrial customers. The water department is interested in coordinating with the Washington Township Municipal Authority to expand its service by providing potable water to other customers. Bally obtains its water supply from the bedrock aquifer underlying the Borough. This

aquifer appears to have been contaminated as the result of separate disposal activities associated with the Bally Superfund Site. Bally treats the water to meet drinking water quality criteria and sends the finished water into its distribution system.

Coordination among EPA, the Pennsylvania Department of Environmental Protection (PADEP), the Washington Township Municipal Authority, the borough of Bally, Hereford Township and Washington Township would be required for the construction of the water line extension and for administration and management of the extended water supply service. It is presumed that the administration, management, and long-term operation and maintenance of the supply well and treatment would remain the responsibility of the borough of Bally.

Institutional controls such as ordinances or deed restrictions may be employed to prohibit the use of contaminated groundwater for drinking water, if treatment is not employed. Existing residential supply wells and selected monitoring wells would be incorporated into a long-term monitoring network to determine whether the water supplies of other residences may be affected by groundwater contamination. Groundwater would be monitored annually for VOCs and metals. Because contaminants would remain in the aquifer and would continue to pose threats to groundwater users, 5-year reviews would be conducted to assess the status of Site conditions and to review risks.

Alternative 4 would comply with federal and state chemical-specific ARARs since the water line would furnish water that has been treated by the municipal water supplier to meet the primary drinking water criteria (MCLs).

During the implementation of Alternative 4, all reasonable measures would be taken during excavation and installation of the water line to comply with the federal and state ARARs. Measures would be implemented to avoid disturbance of any wetlands or impairment of the storage capacity of any flood plains. Prior to the initiation of construction, a review would be conducted to identify any endangered species or sensitive habitats that may be encroached by the installation of the water line. Should any historic or archeological artifacts or objects be encountered during construction, the appropriate federal and state agencies would be notified to coordinate measures that would preserve or mitigate any adverse effects that might be identified.

Alternative 4 would comply with the requirements under Title 29 of the Code of Federal Regulations for occupational safety and health since workers who install and perform periodic maintenance of the water line and workers who perform the sampling of the long-term monitoring wells would conform with these requirements. During excavation and construction, erosion control measures would be implemented, as appropriate, to minimize sediment discharges into surface water bodies. Erosion control measures include silt fences, runoff collection and sedimentation ponds, surface water diversions, stabilization of slopes, channels, and ditches, and minimization of the exposed areas for earth-moving activities.

The cost estimate for implementation of Alternative 4 is  
Capital costs: \$7,324,000

Average annual O&M costs:       \$117,240 (years 1 through 4)  
  \$102,740 (year 5)  
  \$88,240 (years 6 through 30)

Five-year reviews:               \$23,000 per event

Over a 30-year period, the net present-worth cost of Alternative 4 is \$8,566,383 for a branched distribution system or \$11,140,151 for a looped distribution system.

Note: This alternative would not pay for residential water bills and these costs do not include the cost for service after installation.

## **IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES**

The following summary profiles the performance of the alternatives in terms of the nine criteria, noting how each compares to the other alternatives under consideration.

### **A. Overall Protection of Human Health and the Environment**

Alternatives 2, 3, and 4 would all prevent exposure to groundwater that is contaminated in excess of drinking water criteria or risk-based limits. .

### **B. Compliance with ARARs**

Alternatives 2, 3, and 4 would comply with chemical-, location-, and action-specific ARARs.

### **C. Long-Term Effectiveness and Permanence**

Alternatives 2, 3, and 4 would all reduce carcinogenic and noncarcinogenic risks to below or within the acceptable risk range for the long term. Under Alternative 2, increases in the levels of groundwater contaminants could potentially expose the drinkers of bottled water to unacceptable risks through the dermal contact or inhalation exposure pathways. Alternative 3 would be effective and reliable if the treatment system is properly operated and maintained. Alternative 4 would be effective and reliable and increases in groundwater contaminant concentrations would not affect the protection afforded by the new supply line.

### **D. Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternative 2 would not treat the groundwater and would not reduce the toxicity, mobility, or volume of contaminated groundwater. Alternative 3 would treat an estimated 125 gallons of groundwater per person per day. The VOCs captured by the treatment would be disposed off-site. Alternative 4 would not treat water from the aquifer beneath the Crossley Farm Site. The contaminated groundwater that would be treated is associated with another NPL site in Bally Borough. The VOCs captured through this treatment would be vented to ambient air.

### **E. Short-Term Effectiveness**

Alternative 2 can be completed within 6 months. Alternative 2 is reliable, and no difficulties are expected through the construction and operation of the systems. Additional actions can be readily implemented if required after the 5-year review. Long-term monitoring would identify any additional homes with contaminated water supplies; bottled water could rapidly be provided to these homes on short notice.

Alternative 3 can be completed within 6 months. Alternative 3 would be slightly more difficult to construct than Alternative 2 and would require water deliveries in the near term until all the treatment units are installed. Additional actions can be readily implemented if required after the 5-year review. Long-term monitoring would identify any additional homes with contaminated water supplies. Point-of-entry treatment systems could be installed in these homes. However, bottled water would need to be provided until the systems were installed.

Alternative 4 can be completed within 2 to 4 years. Alternative 4 would be the most difficult to construct. Extensive excavations and construction would be required. In addition, considerable lead time would be needed for ordering and purchasing pumps and piping. Additional actions can be readily implemented if required after the 5-year review. Long-term monitoring would identify any additional homes with contaminated water supplies. These homes could be readily connected to the public water line, since the main distribution network would already be established. However, bottled water would need to be provided until the connections were made.

#### F. Implementability

The technologies and equipment needed for the implementation of Alternatives 2, 3, and 4 are readily available. The deed restrictions associated with each alternative may be difficult to implement. For Alternative 2, coordination among agencies may be required for the delivery of water. For Alternative 3, coordination among agencies may be required for the installation and service of the treatment systems. For Alternative 4, coordination among various agencies and local municipalities would be required for the construction and administration of the water distribution system, including the maintenance of the water lines and pump, the collection of fees, and service.

#### G. Cost

The costs for each alternative are summarized in the following table. For each alternative, \$23,000 is for reviews, which would occur every 5 years.

Cost Criteria	Alternative 1: No Action	Alternative 2: Delivered Water	Alternative 3: Point-of-Entry Treatment	Alternative 4: Water Line
Capital Cost	\$0	Alt. 2A: \$120,420 Alt. 2B: \$22,270	\$172,230 for	\$7,324,000 branched \$9,887,000 looped
Annual O&M	\$44,120	Alt. 2A: \$314,440 Alt. 2B: \$140,200	\$117,240 for	\$117,240 years 1-4 \$102,740 year 5 \$88,240 years 6-30
Present-Worth Cost	\$597,117	Alt. 2A: \$4,071,951 Alt. 2B: \$1,811,645	\$1,676,700	\$8,566,383 branched \$11,140,151 looped

#### H. State Acceptance

PADEP supports EPA's selected remedy for point of entry treatment systems.

#### I. Community Acceptance

Generally the community is supportive of the selected remedy for point of entry treatment systems. There was also a lot of concern about the proposed water line alternatives. Most of the organized groups representing environmental interests and several individuals did not want the waterline to pass through the lower part of Forgedale Road by the creek because they felt this was an environmentally sensitive area and should not be disturbed. Some voiced support for the alternative to construct a new well field closer to the affected homes and then build a water line in only the affected area.

### X. THE SELECTED INTERIM REMEDY

EPA's selected interim remedy for addressing the contamination at the Site is similar to Alternative 3, point of entry treatment systems, with some variations to the components of this alternative. As in Alternative 3, the point of entry treatment units will be provided to the 15 homes which are currently treated with filtration units under the EPA removal program and an additional 14 homes where the detected groundwater contamination exceed an MCL. Unlike Alternative 3, the point of entry treatment units may also be provided to other residences whose sampled well water detected contamination below a MCL, *and* those who may be potentially impacted by the Site. Another variation is an increase in the periodic sampling frequency from one year to every six months.

This remedy is consistent with the preferred alternative discussed in the text of the proposed plan and EPA has made some assumptions for costing purposes. At this time there may be as many as 70 residences that could be provided filtration units for their home wells. This is based on water samples showing at least one detection of contamination in any of the previous sampling and analyses. The cost calculations below also assume that 50 other residences in the study area will not need filtration units. The 120 residences will be sampled every 6 months to determine if any changes in the filtration units should be made and if any additional units should be installed. The sampling program will also include selected monitoring wells and springs. The installation of the filtration units will be installed by EPA. Once the filtration units are operational and functional for purposes of 40 C.F.R. Section 300.435(f), PADEP will maintain the units. The sampling program would be implemented by EPA during the interim action and then by PADEP when the O&M period begins. To the extent the interim remedy will require transportation, regeneration or disposal of carbon, all off site actions must comply with federal and state laws and regulations.

For estimating the potential cost of the remedial alternative, the duration of the interim remedy will be for 5 years. EPA expects a final remedy, which may be different from this interim remedy, to be selected by the fall of 1998. However, the five years used for this cost estimate is expected to be sufficient to protect the residents until the final remedy is implemented.

Capital costs: \$425,473  
Average annual O&M costs: \$305,920  
Five-year reviews: \$23,000 per event  
Over a 5-year period, the net present-worth cost of this Alternative is \$1,679,745

This interim remedial action will proceed into the next step which is the design stage for the point of entry treatment systems. The exact number of homes and any possible variation in the treatment systems may be reviewed and changed, if appropriate.

EPA must also contact any of the potentially responsible parties for this site to review their liability and their capability and or willingness to implement the design and construction of the selected remedy.

## **XI. STATUTORY DETERMINATIONS**

CERCLA directs EPA to select remedial actions that are protective of human health and the environment. Section 121 of CERCLA also requires that the selected remedial action comply with ARARs, be cost effective and utilize permanent treatment technologies to the maximum extent practicable. The following sections discuss how the selected remedy for the Hereford Groundwater / Crossley Farm Site meets these statutory requirements.

### **A. Protection of Human Health and the Environment**

The selected interim remedy is protective of human health in that it provides for the treatment of the contaminated home wells for the residents who are actually and potentially affected. The water will meet the drinking water quality standards as long as the filters are maintained. The remedy is also protective of the environment by limiting the construction activities to individual home wells and by providing some removal of the contaminated groundwater for treatment before it is discharged into the area springs and streams.

### **B. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)**

Section 121(d)(1) of CERCLA provides that remedial actions shall meet all federal and state environmental requirements that are applicable or relevant and appropriate.

ARARs fall into three categories, depending on the manner by which they are applied to a site. The characterization of an ARAR may not be unique, as some ARARs are combinations of the following three categories:

1. Contaminant-Specific: Health- or risk-based numerical values or methodologies that establish clean-up levels or discharge limits for particular contaminants.

Federal Safe Drinking Water Act (SDWA) and Maximum Contaminant Levels (MCLs) 40 C.F.R., Section 141.60 For .005 mg/l of Trichloroethene (TCE).

The Pennsylvania Safe Drinking Water Act of May 1, 1984, P.L. 206, 35 P.S. Section 721.4(a).

2. Location-Specific: Restrictions based on the concentration of hazardous substances or the conduct of activities at specific locations. These may limit or preclude certain remedial actions or may apply to portions of a site.

There are no location-specific ARARs.

3. Action-Specific: Technology- or activity-based controls or restrictions on activities related to the management of hazardous waste.

There are no action-specific ARARs.

PADEP has identified Act II as an ARAR for this interim remedy; EPA has determined that Act II does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

#### C. Cost Effectiveness

The selected remedy is cost effective in providing overall protection in proportion to cost, and meets all other requirements of CERCLA. The point of entry treatment units will meet the contaminant-specific ARARs and in conjunction with the continued monitoring program will provide the appropriate level of protection to affected residents and those who are potentially affected.

#### D. Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable (MEP)

EPA has determined that this remedial action is only an interim solution for the Site to remain in force until the full RI/FS is completed.

#### E. Preference for Treatment as a Principal Element

The selected remedy does use treatment that will help to remove contaminated water from the vicinity of the plume but it does not fully address the entire plume area. Since this is only an interim remedy, the full scope of the remedy for the site will evaluate source removal as well as groundwater extraction for removal and or containment of the contaminated plume.

## **XII. DOCUMENTATION OF SIGNIFICANT CHANGES**

The Proposed Plan for the Crossley Farm Site was released for public comment on February 10, 1997. The Plan identified Alternative 3, Point of Entry Treatment as the preferred alternative. EPA reviewed all written and oral comments submitted during the public comment period. It was determined that no significant changes be made to the remedy as it was originally identified in the Proposed Plan.

**RESPONSIVENESS SUMMARY  
HEREFORD GROUNDWATER / CROSSLEY FARM SITE  
HEREFORD TOWNSHIP, BERKS COUNTY, PENNSYLVANIA**

This community relations responsiveness summary is divided into the following sections:

Overview: This section discusses EPA's preferred alternative for remedial action.

Background: This section provides a brief history of community interest and concerns raised during remedial planning at the Crossley Farm Site.

Part I: This section provides a summary of commentors' major issues and concerns and expressly acknowledges and responds to those raised by the local community. "Local community" may include local homeowners, businesses, the municipality, and potentially responsible parties (PRPs).

**OVERVIEW**

On February 10, 1997, EPA announced the public comment period and published its preferred alternative for Operable Unit 1 for the Crossley Farm Site, located in Hereford Township, Berks County, Pennsylvania. EPA screened four possible alternatives to remediate residential drinking water contamination, giving consideration to nine key evaluation criteria:

**BACKGROUND**

EPA has divided the Crossley Farm Site into two components: Operable Units 1 and 2. Operable Unit 1 (OU1) consists of the Site's contaminated residential drinking water supplies. Operable Unit 2 (OU2) consists of the soil, sediment, surface water, and regional ground water contamination.

To obtain public input on the Proposed Remedial Action Plan (Proposed Plan or PRAP) for OU1, EPA held a public comment period from February 10, 1997, to March 12, 1997. A public meeting on the Proposed Plan was held on March 5, 1997.

Those in attendance at the meeting included local area residents and officials, news media representatives, representatives from EPA and the Agency for Toxic Substances and Disease Registry (ATSDR), and representatives from companies interested in Site activities and clean-up decisions. EPA briefed local officials prior to the public meeting.

EPA notified the public of the March 5, 1997 public meeting and announced the public comment

period in a display ad placed in the February 10 and 24, 1997, editions of the *Allentown Morning Call*.

In addition, EPA established Site information repositories at the Hereford Township Municipal Building and the Washington Township Municipal Building. The repositories contain the Focused Feasibility Study Report, the PRAP, and other relevant documents. EPA's Administrative Record for the Site, which encompasses the key documents the Agency uses in selecting the Site remedy, also is housed at the repositories.

EPA also prepared a fact sheet and distributed it to individuals on the Site mailing list and in attendance at the public meeting. The fact sheet included a summary of the Proposed Plan.

### **PART I: SUMMARY OF COMMENTORS' MAJOR ISSUES AND CONCERNS**

This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. The major issues and concerns about the proposed remedy for the Crossley Farm Site received at the public meeting on March 5, 1997, and written responses received during the public comment period, can be grouped into seven categories:

- A. Support or Rejection of Alternatives
- B. Human Health Concerns
- C. Schedule
- D. Previous Sampling
- E. Remedial Alternatives for OU1
- F. Remedial Investigation/Feasibility Study for OU2
- G. Property Values/Superfund Issues

The questions, comments, and responses are summarized below.

#### **A. Support or Rejection of Alternatives**

- The majority of written received indicated support for the Point of Entry Treatment Systems. Nine of the thirteen commentors supported the Agency's preferred alternative. Several of them expressed that Alternative 3 provides the "greatest level of health safety and practicality, with the lowest level of environmental disturbance".
- Five of the commentors expressed a strong rejection of the Waterline alternative. Their reasons included the destruction of the environment along Perkiomen Creek and opposition to development. Some suggested that the developers or the water authority should bear the costs instead of the Superfund remedy. Others suggested that if a waterline should actually be built an alternative route would be shorter and less damaging to the creek environment.

- Five of the commentors expressed a preference for an alternative to drill a new well field closer to the affected homes and set up a new distribution system for them. This alternative was not pursued in the FFS because the Agency does not have enough information on the groundwater flow to determine where this new well field should be located so that it would be remain free from contamination.

EPA Response: The Agency also cannot identify any municipal authority that would be able to operate the system which would primarily be located in Hereford Township.

- Two of the commentors also suggested that the Agency buy the homes of those affected.

EPA Response: This is not an alternative that was presented in the FFS and is not one that the Agency can select. The Superfund program does not buy and move property owners when a protective remedy can be provided for the individual home owners.

## **B. Human Health Concerns**

- One resident commented that EPA has not proven that the contamination levels detected in the ground water at the Site are harmful to human health.

EPA Response: EPA is currently reviewing the toxic effects of trichloroethylene, the most prevalent contaminant detected in the ground water at the Site. EPA is not stating that because trichloroethylene is under review that it is not toxic, but that EPA is unsure how toxic trichloroethylene really is. EPA will issue more information on the subject next year.

However, EPA is charged by Congress to clean up the contaminated drinking water supplies at the Site to Maximum Contaminant Levels. Maximum Contaminant Levels are levels at which contaminants do not pose an immediate threat to human health or the environment.

- A resident asked about the risks to human health from using the existing treatment systems currently in place at several residences or the water treatment system EPA proposes for use under Alternative 3.

EPA Response: The carbon filtration units currently installed are designed to remove the contaminants detected at the Site. EPA has continued to sample and analyze drinking water in those homes and has periodically replaced the carbon filtration units. When these treatment systems are maintained, the residents are protected from the human health effects from Site related contaminants.

- A resident asked about the adverse health effects of trichloroethylene.

EPA Response: Trichloroethylene may cause nausea and abdominal pain from acute exposure at levels well above the Maximum Contaminant Level of 5 parts per billion. Short term exposure

at a high dose can lead to unconsciousness and possibly death. Trichloroethylene has the potential to cause liver damage from a lifetime exposure at levels above the Maximum Contaminant Level. There is some evidence that trichloroethylene may cause a slight increase the potential for cancer from a lifetime exposure at levels above the Maximum Contaminant Level of 5 ul/L. Increases in the concentration of exposure over a lifetime may also increase the potential for cancer.

- A resident asked whether trichloroethylene can affect other media, such as soil or air, or livestock.

EPA Response: Trichloroethylene can affect other media at the Site. EPA will investigate the soil, sediment and surface water in the vicinity of the Site. If a source of contamination is found that source will be removed. It would be appropriate to assume that drinking the contaminated groundwater could pose a threat to livestock, but specific effects are not known. EPA's major concern at the Crossley Farm Site is trichloroethylene detected in the residential drinking water supplies. The Agency has documentation about health risks Trichloroethylene may pose to residents using contaminated water for drinking, showering, or bathing.

- A resident asked about the risks to residents drinking contaminated ground water.

EPA Response: EPA's acceptable level of cancer risk for Superfund sites ranges from one excess cancer case per 10,000 people exposed to one excess cancer case per one million people exposed. This translates to a risk range of between one in 10,000 and one in one million additional cancer cases. Expressed in scientific notation, this risk range is between  $1.0E-04$  and  $1.0E-6$ . Because ground water contamination levels vary from residential well to residential well, the risk to residents drinking the ground water at the Crossley Farm / Hereford Groundwater Site also varies. In general, the risk range for the wells is between  $1.0E-03$  and  $1.0E-06$ . Remedial action is warranted at a site when the calculated cancer risk level for potentially exposed individuals exceeds  $1.0E-04$ . Since this is the case for several wells at this Site, EPA proposed implementing the interim remedy to reduce the risk to residents. Specific risk values for individual wells can be found in the Focused Feasibility Study for OU1 located at the information repositories.

- Several residents were concerned about being allowed to drill drinking water supply wells during the last five to eight years without knowing about ground water contamination at the Site.

EPA Response: EPA does not have any authority to regulate home owner development and use of the groundwater from the property. As far as the Agency knows, the township has informed applicants for the permit necessary for a new groundwater well.

- One resident has been experiencing skin irritation, smell, bacteria, and discoloration. They also want new well due to septic tank location on their property.

EPA Response: EPA has investigated the bacterial contamination for these residents and samples

have revealed bacterial contamination at the tap, but not at the well. The tap was subsequently cleaned and then sampling results showed the tap water to be clean. There is no obvious explanation for these problems. The Remedial Design will consider the possible installation of a new well since the current well does not meet Township regulations.

### **C. Schedule**

- Several residents asked about the schedule for Site cleanup.

EPA Response: EPA considers Alternative 3, installing water treatment units to treat ground water upon entry into affected homes, an interim remedy. EPA is considering this remedy for all homeowners in the area who are affected by Site contamination. This type of treatment system is very effective in removing trichloroethylene from ground water. EPA estimates that installation of the units in the homes of affected residents could begin in approximately nine to twelve months.

EPA is currently investigating soil, sediment, surface water, and ground water contamination as part of the Remedial Investigation for OU2. When EPA completes the Remedial Investigation and Feasibility Study in the spring or summer of 1998, EPA will propose a final remedy for the entire Site. Then, EPA will issue another proposed plan which will include some alternatives included in the Proposed Plan for OU1 and some new alternatives for cleanup of the regional ground water contamination. Therefore, this remedy is considered interim until the Remedial Investigation and Feasibility Study for OU2 are completed and the clean-up plan for OU2 is selected.

### **D. Previous Sampling**

- A resident asked about the location of the farthest point that EPA sampled from the suspected origin of ground water contamination.

EPA Response: The farthest point EPA sampled from the suspected origin of ground water contamination (near the crest of Blackhead Hill) is a well located near the intersection of Forgedale and Dale Roads.

- A resident asked whether EPA sampled the spring located at Forgedale Road and Old Route 100. If so, the resident wanted to know why that spring was sampled since it is located far from the Crossley Farm Site.

EPA Response: EPA did test the spring located at Forgedale Road and Old Route 100. Testing by EPA showed no trichloroethylene contamination in the spring water. EPA tests this spring because ground water which flows through the fractured bedrock likely flows from the Site towards the spring. EPA also feels that the spring water should be tested because many people in the area use the spring water for various purposes, and EPA wants to make sure the water is not contaminated with trichloroethylene.

- A resident asked why EPA removes the aerator from the faucet prior to sampling.

EPA Response: EPA removes the aerator from the faucet prior to sampling in order to get an accurate reading of the volatile organic compounds, compounds that easily evaporate at room temperature, in the tap water. An aerator is designed to disperse volatile compounds into the air and thereby lessen the amount of volatile compounds that remain trapped in the tap water. If the aerator remained on the faucet during sampling, less of the volatile organic compounds would be detected in the tap water than actually exist.

- A resident asked how many residents had ground water detections of trichloroethylene below the action level of 5 parts per billion.

EPA Response: There are 29 home wells in the area and two wells that are considered public supply wells at the trailer park located on Dale Road that show historical detections of trichloroethylene greater than 5 parts per billion. EPA estimates that up to an additional 40 homes may have detections below 5 parts per billion and therefore, will be considered for receiving water treatment units.

- A resident wanted to know the location of the ground water plume.

EPA Response: The contaminated ground water plume originates at the top of black head hill and extends downwards toward the intersection of Dale and Forgedale Road. Further investigation of the extent of contamination will be conducted and a more comprehensive map will be prepared.

- A resident asked if the same contaminants found at this Site were also detected at the nearby Berks Sand Pit Superfund Site, located in Longswamp Township.

EPA Response: The most prevalent contaminant detected the Crossley Farm Site, trichloroethylene, was not detected at the Berks Sand Pit Site. Trichloroethane is the contaminant of concern detected at Berks Sand Pit. Both compounds behave similarly and have similar human health effects but are not the same compound.

- A resident wanted to know if Bally Case and Cooler, a local manufacturer located near the Crossley Farm Site, used trichloroethylene and trichloroethane in its operations.

EPA Response: In correspondence from Bally Engineered Structures, Inc., the successor to Bally Case and Cooler, they have acknowledged use of trichloroethylene. Trichloroethane was not specifically mentioned in their correspondence.

- A resident asked whether EPA was sampling and analyzing a nearby well associated with the Bally Municipal System. The ground water extracted from the Bally well is contaminated with the same compound associated with the Crossley Farm Site, trichloroethylene.

EPA Response: The site is known as the Bally Ground Water Contamination Site, located in Bally,

Pennsylvania. Ground water at this Superfund Site, which is used as a public drinking water supply for residents of Bally and neighboring towns, is contaminated with various volatile organic compounds including trichloroethylene. Treatment of the Bally ground water includes air stripping which removes the volatile organic compounds and makes the ground water suitable for public drinking water consumption.

- Several residents asked about the possibility of the land farming operations at the Crossley Farm Site contributing to the Site's contamination.

EPA Response: EPA reviewed the analytical results of the land-farmed sludge. The results showed no detections of trichloroethylene or any of the volatile organic contaminants associated with the Crossley Farm Site.

- A resident asked EPA if ground water contamination could exist even if all contaminants are reported as non-detects.

EPA Response: Yes it is a possibility. All analytical methods have a detection limits associated with specific compounds. However, the residential well analysis performed at the EPA laboratory used a very low detection limit for this Site

#### **E. Remedial Alternatives for OU1**

- Several residents asked EPA to describe Alternative 3, water treatment units installed upon entry into the homes of affected residents.

EPA Response: EPA plans to use a dual carbon system treatment unit for treating contaminated ground water under this alternative. As the ground water enters each affected home, the water will initially flow through a pre-filter to remove small particles. The water will then enter the first or primary activated carbon unit where most of the contaminants are removed. As a safety measure, EPA designed this alternative to include a second activated carbon unit to capture any contaminants that might break through the first unit. Any contaminant that might break through the first unit would be in very low concentrations, because the first unit would remove most of the compound. The second unit would definitely remove any remaining contamination. After the water passes through these units, it travels through an ultraviolet system which destroys any bacteria in the water. Once the water is disinfected, it is stored in a holding tank until it ultimately flows to the user through the home's indoor plumbing system. Sample ports are located along the entire system so that samples can be taken at any point prior, during, or after treatment.

- A resident asked how often would EPA replace the activated carbon units under Alternative 3.

EPA Response: EPA plans to sample residents' wells every six months. If the sampling results reveal that an activated carbon unit needs replacement, EPA would replace the unit promptly. However, EPA designed the units so that they should last one year before the activated carbon needs

replacement.

- A resident asked for the dimensions of a typical activated carbon unit under Alternative 3.

EPA Response: The dimensions of a typical activated carbon unit are one foot in diameter by four feet tall.

- A resident asked whether EPA identified potential residences to receive treatment though sampling conducted more than 15 months ago. If so, how do residents who were identified then as uncontaminated know that they are not contaminated now?

EPA Response: As part of the Remedial Investigation currently being conducted at the Site, EPA plans to resample all residential wells and springs in the study area. Therefore, even if a resident's well had no history of contamination, a resident would be eligible to receive the water treatment unit specified under Alternative 3 if the resampling revealed contamination.

- A resident expressed concern over the adequacy of Alternative 3, water treatment units installed in homes of affected residents, to treat his ground water, since the contamination in his ground water continues to rise.

EPA Response: Under Alternative 3, EPA will design the water treatment units to remove contaminants detected at high levels from the ground water. EPA will also design the units to last one year before the activated carbon needs replacement. EPA plans to sample ground water every six months to ensure the adequacy of the units. If the sampling results reveal that a unit needs replacement, then EPA will promptly replace the unit.

- Several residents expressed concerns about not being included under Alternative 3 if their properties do not have wells installed presently.

EPA Response: Any new residential well installed will also be sampled for the protection of the homeowner when the Agency is sampling the other home at the Site. If the sampling results reveal that the drinking water is contaminated the home will be considered for the point of entry treatment units under Alternative 3.

- A resident asked if EPA plans to install treatment units at all properties that border the Site, even if detected levels of trichloroethylene are below the action level of 5 parts per billion.

EPA Response: Under Alternative 3, EPA proposes to install water treatment units on all residential wells which have historical detections of contamination, even if detection levels are below action levels.

- Several residents asked if EPA plans to install water treatment units on wells with no history of past contamination.

EPA Response: EPA will consider a property a candidate for receiving a water treatment unit when the resident's ground water has no historical detections of contamination if that home is in the pathway of migration for the plume .

- Several residents commented that the only viable alternative to address the contaminated ground water is Alternative 4, extending an existing water line from the nearby Borough of Bally to the affected residents' homes.

EPA Response: EPA considered several different criteria during the process of evaluating the alternatives for the Site. These criteria are described in the Comparative Analysis section of this Record of Decision. Alternative 3, installing water treatment units, provides the most reasonable balance between the various criteria. Alternative 3 is also an interim remedy, which means that when the Remedial Investigation and Feasibility Study are completed in a few years, EPA will reevaluate the regional ground water contamination in the area and possibly select Alternative 4 or another alternative as the final remedy for the Site.

- A resident commented that, under Alternative 4, the closest route from the municipal provider's supply line to affected residents is via Crow Road.

EPA Response: EPA acknowledges this and will take this comment into consideration if Alternative 4 is reconsidered for addressing regional ground water contamination after the Remedial Investigation is completed.

- A resident asked about the monthly cost of receiving municipal water under Alternative 4.

EPA Response: Under Alternative 4, EPA estimated that the cost of receiving municipal water would be approximately \$35 to \$40 per month payable by the homeowner. EPA would pay for the water line hook-up to the home.

- A resident commented that, under Alternative 4, Water Line, it would appear more cost-effective to locate a municipal well near the Site and treat and distribute the ground water from there rather than pump water to the affected residents from the existing Bally Municipal supply wells located four miles away.

EPA Response: Locating a municipal well near the Site and pumping and treating the ground water would still be very expensive. However, when the Remedial Investigation is completed in a few years, EPA will evaluate the regional ground water contamination in the area and select a remedy that effectively addresses the ground water contamination in the area. At this time, EPA will consider all possible alternatives, including those suggested by the local community.

- A resident asked what agency determined the layout of the water line as shown under Alternative 4.

EPA Response: EPA determined the present layout of the water line under Alternative 4. However,

if EPA selected this alternative as the preferred alternative to address contaminated drinking water supplies, EPA would consult with the water authority proposed to operate the water line and with local communities concerning where the water line would be located.

- A resident wanted EPA to dispel rumors that Washington Township Municipal Authority, the authority that would most likely operate and maintain the water line proposed under Alternative 4, lobbied EPA to select this alternative so that the authority could install sewer pipe as it installs the water line at no cost to the authority.

EPA Response: No authority or agency has lobbied EPA for any of these alternatives specified in the Proposed Plan. EPA did approach Washington Township Municipal Authority regarding Alternative 4. Prior to providing Alternative 4 as a feasible alternative to address contaminated public drinking water supplies, EPA needed to make sure that the authority was interested in providing water to the public.

- A written comment asked why The Agency did not consider a small type of air stripper to treat The drinking water at individual domestic wells.

EPA Response: Residential air stripping units were considered in The FFS under alternative 3 (Point of Entry Treatment) but were not chosen. The reasons include The following:

- a) A two-tray air stripping unit would be required and its operation could be loud enough to disturb The resident.
- b) Carbon and UV treatment units could be necessary after stripping. Which would increase capital costs.
- c) The off gas (stripped volatile organic contaminants) could not be vented to The atmosphere and would require capture by carbon adsorption.

- A written comments asked why the Agency would place filtration systems in homes that do not exceed the MCL or other health based criteria since the Agency will be sampling every 6 months?

EPA Response: Since it is difficult to predict when a residential well could be impacted by contaminated ground water above an MCL or risk based concentration when it is already impacted below these concentrations and lies within the plume boundary, EPA believes that it is reasonable to assume that these wells will likely be impacted above the MCL or risk based concentration in order to be more protective of these residents.

#### **F. Remedial Investigation/Feasibility Study for OU2**

- A resident commented that EPA's main focus should be on locating sources of contamination at the Site.

EPA Response: One of EPA's main focuses is locating sources of contamination at the Site. EPA is currently conducting a Remedial Investigation at the Site to determine the location, type and amount of contamination at the Site.

- Residents commented that the Remedial Investigation should be guided by the information provided by local persons who claim to have knowledge of past dumping activities and their locations.

EPA Response: EPA conducted a lengthy investigation into determining the past dumping history of the area. The investigation included reviewing historical aerial photographs and interviewing local residents and officials. As part of the Remedial Investigation currently being conducted at the Site, EPA is exploring several locations identified through this research to determine if they are the source of contamination at the Site.

- A resident asked if EPA plans to investigate mine shafts located at the Crossley Farm Site as part of the Remedial Investigation.

EPA Response: EPA will refer the investigation of mine shafts in the vicinity to the Pre-remedial Investigation Section to determine if the shafts contain any sources of contamination.

- A resident asked if EPA tests the head waters in the area as part of the Remedial Investigation currently being conducted at the Site.

EPA Response: EPA conducted one round of surface water and sediment sampling upgradient of the Site to determine the quality of water prior to reaching the Site. EPA is currently evaluating the results. EPA will continue this type of sampling as part of the Remedial Investigation. EPA will publish the results of all rounds of sampling in the Remedial Investigation Report.

- A resident wanted to know, when the Remedial Investigation is finished, whether EPA will reconsider Alternative 5, Well Field, as a possible alternative for the residential drinking water supplies.

EPA Response: EPA will reconsider Alternative 5, Well Field, as a possible alternative for the residential drinking water supplies when the Remedial Investigation is completed. EPA screened this alternative out of the recommended alternatives in the Focused Feasibility Study because EPA did not have a location to place the well field nor an agency to operate it.

- A resident asked why EPA is drilling deep wells farther away from The Site instead of close to The Site.

EPA Response: The deep monitoring wells will be used to identify whether ground water contamination exists deep in the aquifer as well as estimate the rate and direction of ground water flow. This type of information will allow EPA to better determine the extent of contamination

in the aquifer and identify who may be potentially impacted from contaminated ground water presently and in the future. EPA has proposed drilling these wells farther away from the site in order to avoid potentially drilling through a source of highly concentrated contamination in the form of dense non-aqueous phase liquid (DNAPL). The contaminant concentrations at the site are at high levels indicative of dense non-aqueous phase liquid. DNAPLs are fluids which are heavier than water and do not readily dissolve in or mix with water. Therefore, when you drill through DNAPL, it has a tendency to move deeper or farther.

- A resident asked if there is a possibility of contaminating uncontaminated ground water via drilling methods used to drill deep wells as EPA proposes in The Remedial Investigation.

EPA Response: Because the deep monitoring wells are being drilled at locations where there is lower levels of ground water contamination than on the site in the shallow portion of the bedrock aquifer, it is unlikely that highly elevated levels of contamination will be brought deeper into the bedrock aquifer. Also, it is highly unlikely that the deeper aquifer is uncontaminated to begin with because DNAPLs, which are likely present at the site, tend to sink as they are heavier than water. However, The deep bedrock wells will be drilled with every precaution to prevent the contaminated ground water from continually flowing to the deeper bedrock. While drilling the deep monitoring wells the shallower zone of the bedrock aquifer will be sealed off from the shallow contaminated ground water through installation of a solid pipe and the pipe will be set with cement.

#### **G. Property Values/Superfund Issues**

- Several residents expressed concern over the negative impact that the ground water contamination has on property values in the area.

EPA Response: EPA is not in the position of talking about property values or property taxes, however, EPA feels that the remedy selected makes the property values in the area the same as other properties that have uncontaminated well water. EPA will provide the treatment unit and sample the water periodically to show the residents that the water is clean, and therefore, increase the homeowner's ability to sell the home.

- One resident wanted to know why EPA identified the Site using a specific individual's name if EPA has no clear evidence regarding who the responsible parties are or where the dumping of hazardous waste occurred.

EPA Response: EPA identified the Site as the Crossley Farm Site when the Site was proposed for the National Priorities List. The Agency believed that the source was on the farm. The site is also known as the Hereford Groundwater Site and EPA decided to use both names in this Record of Decision. The RPM has contacted the appropriate personnel within EPA to re-evaluate the name changes.



Pennsylvania Department of Environmental Protection

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June 30, 1997

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VIA TELEFAX AND FIRST CLASS MAIL

Mr. Thomas C. Voltaggio, Director  
Hazardous Waste Management Division  
US EPA, Region III  
841 Chestnut Building  
Philadelphia, PA 19107

Re: Record of Decision (ROD)  
Hereford Groundwater  
Crossley Farm Site  
Hereford Township, Berks County

Dear Mr. Voltaggio:

The Record of Decision (ROD) for the Hereford Groundwater/Crossley Farm Superfund Site, Berks County, was received June 18, 1997, with an additional amendment received June 26, 1997. It has been reviewed by the Department.

The interim remedial action for this site consists of the following:

- Provide point of entry treatment systems to the residents who are impacted by contamination from the Site.
- Depending on the contaminants identified at specific residences, additional treatment components may be required, such as pH adjustment or a water-softening unit to remove manganese and iron.
- Because this action does not constitute the final remedy for the Hereford Groundwater Crossley Farm Site, the statutory preference is only partially addressed in this interim remedy.

The Department hereby concurs with EPA's interim remedial action with the following conditions:

- Concurrence with the remedy should not be interpreted as acceptance of Operation and Maintenance by the Department. This is entered into during design of the remedy and the completion of a State Superfund Contract.



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June 30, 1997

- EPA will assure that the Department is provided an opportunity to fully participate in any negotiations with responsible parties.
- The Department will be given the opportunity to review and comment on documents and concur with decisions related to the design and implementation of the remedial action, to assure compliance with Pennsylvania ARARs.
- Public comment and the issuance of an Explanation of Significant Differences (ESD) must occur before any modification of the ROD.
- This concurrence with the selected remedial action is not intended to provide any assurances pursuant to SARA § 104(c)(3).

Thank you for the opportunity to comment on this EPA Record of Decision. If you have any questions regarding this matter, please do not hesitate to contact me.

Sincerely,



Michael R. Steiner  
Regional Director

AR300494